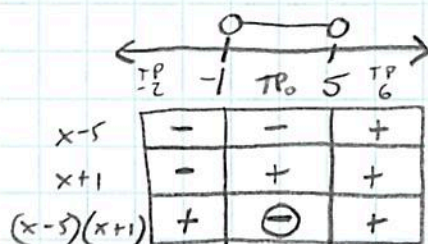


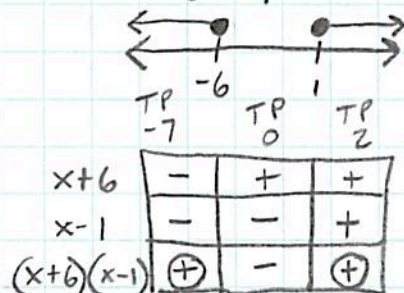
Algebra 2 + Trig Review for Q2 Test 2 Key

1) $x^2 - 4x - 5 \leq 0$ ^{want negatives}
 $(x-5)(x+1)$
 5 -1



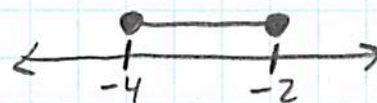
SB: $\{x \mid -1 < x < 5\}$
B

2) $x^2 + 5x - 6 \geq 0$ ^{positives}
 $(x+6)(x-1)$
 -6 1



SB: $\{x \mid x \leq -6 \vee x \geq 1\}$
Int: $(-\infty, -6] \cup [1, \infty)$

3) $x^2 + 6x + 8 \leq 0$ ^{Positive use GOLI}
 $(x+4)(x+2)$
 -4 -2

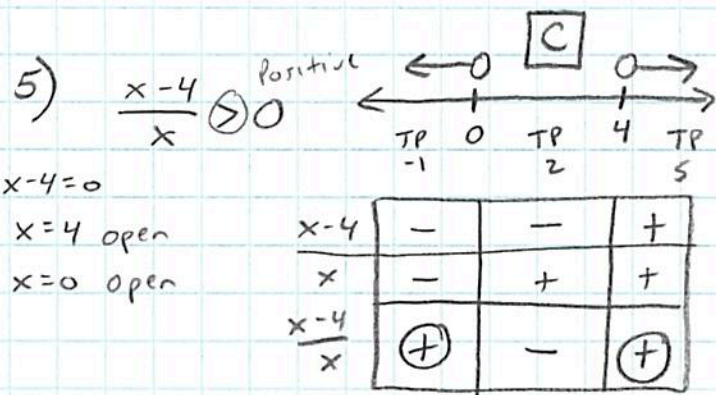


4) $A \rightarrow y > (x+2)^2 - 3$

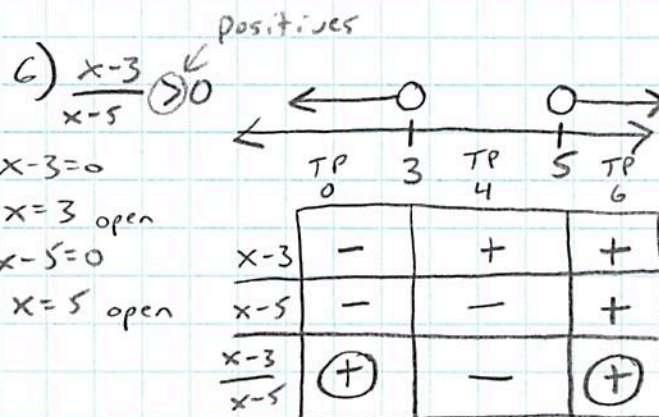
$C \rightarrow y < (x-2)^2 - 3$

$B \rightarrow y > (x-2)^2 - 3$

$D \rightarrow y < (x+2)^2 - 3$



$x-4=0$
 $x=4$ open
 $x=0$ open



$x-3=0$
 $x=3$ open
 $x-5=0$
 $x=5$ open

7) $\frac{3}{x-4} \geq \frac{2}{x}$

$x+8=0$
 $x=-8$ closed

$\frac{CD}{x(x-4)} \frac{3(x)}{x-4(x)} - \frac{2(x-4)}{x(x-4)} \geq 0$

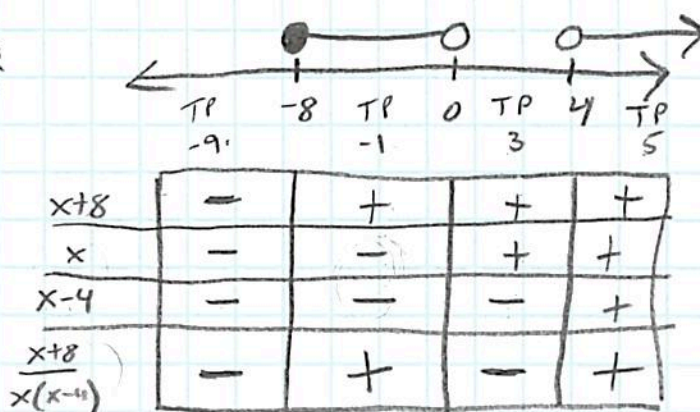
$\frac{3x}{x(x-4)} - \frac{2x-8}{x(x-4)} \geq 0$ ^{positive}

$\frac{x+8}{x(x-4)} \geq 0$

$x=0$ open

$x-4=0$

$x=4$ open



$$8) \quad b^2 - 4ac$$

$$6^2 - 4(1)(11)$$

$$36 - 44$$

$$-8 \quad \boxed{D}$$

$$9) \quad b^2 - 4ac = 0$$

$$4^2 - 4(a)(2) = 0$$

$$16 - 8a = 0$$

$$-8a = -16$$

$$a = 2$$

$$\boxed{B}$$

$$10) \quad b^2 - 4ac \geq 0$$

$$K^2 - 4(2)(1) \geq 0$$

$$K^2 - 8 \geq 0$$

$$K^2 \geq 8$$

$$K \geq \sqrt{8} \approx 2.8$$

$$K \geq 2.8$$

$$\boxed{C}$$

$$11) \quad 3y^2 + 5y - 2 = 0$$

$$a=3 \quad b=5 \quad c=-2$$

$$5^2 - 4(3)(-2)$$

$$25 + 24$$

$$49$$

Real, Rational, Unequal
(Positive) (Perfect)

$$12) \quad \boxed{A} \text{ Never touches the x-axis}$$

$$13) \quad b^2 - 4ac$$

$$(-7)^2 - 4(1)(-60)$$

$$49 + 240$$

$$289$$

Positive Perfect Square

$$\boxed{B}$$

$$14) \quad \boxed{A} \text{ Never touches x-axis}$$

$$15) \quad \boxed{D} \text{ Only touches x-axis once}$$

$$16) \quad \text{sum} = \frac{-b}{a} = \frac{-(-11)}{1} = 11 \quad \boxed{C}$$

$$3x^2 = 9x + 1 \rightarrow 3x^2 - 9x - 1 = 0$$

$$17) \quad \text{sum} = \frac{-b}{a} = \frac{-(-9)}{3} = \frac{9}{3} = 3 \quad \boxed{D}$$

$$18) \quad \text{Product} = \frac{c}{a} = \frac{-2}{2} = -1 \quad \boxed{C}$$

$$19) \quad \text{sum} = \frac{-b}{a} = \frac{-(-7)}{3} = \frac{7}{3}$$

$$\text{prod} = \frac{c}{a} = \frac{12}{3} = 4 \quad \boxed{B}$$

$$20) \quad \text{Have } a, c \text{ so use the product}$$

$$\text{prod} = \frac{c}{a} = \frac{12}{1} = 12$$

$$-4(r_2) = 12$$

$$\sqrt{r_2} = -3$$

21) We have a, b so use the sum of the roots formula

$$\text{sum} = \frac{-(-6)}{2} = \frac{6}{2} = 3 \quad 5 + r_2 = 3$$

$$\boxed{r_2 = -2}$$

22) $\text{Sum} = (5+i) + (5-i) = 10$

$x^2 - 10x + 26 = 0$ (A)

$\text{Product} = (5+i)(5-i) = 25+1 = 26$

23) Other root is $4+3i$

$\text{Sum} = (4-3i) + (4+3i) = 8$

$x^2 - 8x + 25 = 0$ (D)

$\text{Product} = (4-3i)(4+3i) = 16+9 = 25$

24) $\text{Sum} = -\frac{1}{2}$

$\text{prod} = \frac{1}{4}$

$4(x^2 - (-\frac{1}{2})x + \frac{1}{4}) = 0$

$\boxed{4x^2 + 2x + 1 = 0}$

25) $\sqrt{7x-3} + 3 = 2x$

$(\sqrt{7x-3})^2 = (2x-3)^2$

$(2x-3)(2x-3)$

$4x^2 - 6x - 6x + 9$

$7x-3 = 4x^2 - 12x + 9$

$-7x+3 \quad -7x+3$

$0 = 4x^2 - 19x + 12$

$x = \frac{19 \pm \sqrt{(-19)^2 - 4(4)(12)}}{2(4)} = \frac{19 \pm \sqrt{169}}{8} = \frac{19 \pm 13}{8}$

$\frac{19+13}{8} = 4$ (A)

$\frac{19-13}{8} = \frac{6}{8} = \frac{3}{4}$ (B)

does not work

26) $\frac{(ab)\frac{a}{b} - \frac{b}{a}(ab)}{(ab)\frac{1}{a} + \frac{1}{b}(ab)}$

$= \frac{a^2 - b^2}{b+a} = \frac{(a-b)(a+b)}{b+a} = a-b$

\boxed{B}

$\frac{LCD}{ab}$

$$27) 3x^2 + 12x + 10 = 0$$

$$3(x^2 + 4x + \boxed{4}) = \frac{-10}{3} + \boxed{4}$$

Half Square Share $(\frac{4}{2})^2 = 4$ $(x+2)^2 = \frac{2}{3}$ **(D)**

$$28) x^2 - 14x - 12 = 0$$

$$x^2 - 14x + \boxed{49} = 12 + \boxed{49}$$

$$(x-7)^2 = 61$$

$$x-7 = \pm\sqrt{61} \quad \textbf{(A)}$$

$$29) \begin{matrix} a=1 \\ b=9 \\ c=12 \end{matrix} \quad x = \frac{-9 \pm \sqrt{9^2 - 4(1)(12)}}{2(1)} = \frac{-9 \pm \sqrt{33}}{2} \quad \textbf{(B)}$$

$$30) \begin{matrix} x^2 - 3x < 0 \\ x(x-3) < 0 \end{matrix} \quad \textbf{(A)}$$

$x=0$ $x=3$

$$31) \frac{2x+3}{x} \geq x$$

$$\frac{2x+3}{x} - x \geq 0$$

$$\frac{2x+3}{x} - \frac{x^2}{x} \geq 0$$

$$\frac{-x^2 + 2x + 3}{x} \geq 0$$

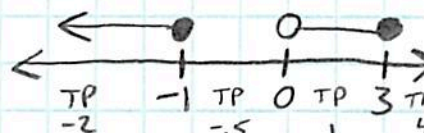
$$0 \geq \frac{x^2 - 2x - 3}{x}$$

Negatives $0 \geq \frac{(x-3)(x+1)}{x}$

$$x=3 \text{ closed}$$

$$x=-1 \text{ closed}$$

$$x=0 \text{ open}$$



$x-3$	-	-	-	+
$x+1$	-	+	+	+
x	-	-	+	+
$\frac{(x-3)(x+1)}{x}$	⊖	+	⊖	+

$$SB: \{x \mid x \leq -1 \text{ or } 0 < x \leq 3\}$$

$$\textbf{(B)}$$

$$32) \frac{7}{x} - 4 = \frac{-4x}{x+1} \quad \text{LCD: } x(x+1)$$

$$\frac{7(x+1)}{x(x+1)} - \frac{4x(x+1)}{x(x+1)} = \frac{-4x(x)}{x(x+1)} = \frac{7x+7-4x^2-4x}{+4x^2} = \frac{-4x^2}{+4x^2}$$

$$3x+7=0$$

$$3x = -7$$

$$x = -\frac{7}{3} \quad \text{(C)}$$

$$33) |x-3| > 5$$

$$\begin{array}{r} x-3 > 5 \\ +3 \quad +3 \\ \hline \end{array}$$

$$x > 8$$

$$\begin{array}{r} x-3 < -5 \\ +3 \quad +3 \\ \hline \end{array}$$

$$x < -2$$

or
(B)

$$34) 2\sqrt{50} - 3\sqrt{8}$$

$$2\sqrt{25}\sqrt{2} - 3\sqrt{4}\sqrt{2}$$

$$2(5i)\sqrt{2} - 3(2i)\sqrt{2}$$

$$10i\sqrt{2} - 6i\sqrt{2}$$

$$\boxed{4i\sqrt{2}}$$

(C)